Tropical Winds

The Official Newsletter of WFO Miami

Winter View of Downtown Miami / Snowflakes on the Miami Tower - Dan Gregoria

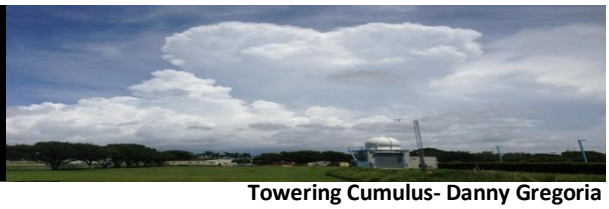
Winter 2013

Welcome to this edition of Tropical Winds. Another hurricane season to be thankful for (…unless you are a hurricane junkie…). In this edition, we will discuss what occurred during this year's wet season and what to expect for the dry season. Also, we will talk about tornado climatology across South Florida. A look back at the 2013 Atlantic hurricane season will follow. To finish on a happy note, we will introduce you to another one of our devoted forecasters, Chris Duke.

Happy Holidays!!!

In This Issue…

Weather Review and Outlook



Towering Cumulus- Danny Gregoria

By David Ross and Rob Molleda

Looking Back at the Rainy Season

May – October 2013

Synopsis

The recently-concluded rainy season was wetter than normal across most of South Florida. It was very wet over most of southwest Florida where rainfall totals for the period from May 18th to October 10th (the duration of this year's wet season) were in the 40 to 50 inch range, with a few spots exceeding 50 inches (Figure 1). This almost equals a year's worth of rain in less than five

months! Isolated spots in southeast Florida also recorded over 50 inches of rain, with most of this area receiving between 35 and 45 inches. Every month of the rainy season featured above normal rainfall over different parts of south Florida, with July being the wettest month overall due to a more widespread rainfall coverage, and August being the driest mostly across the eastern half of the peninsula (Figure 2).

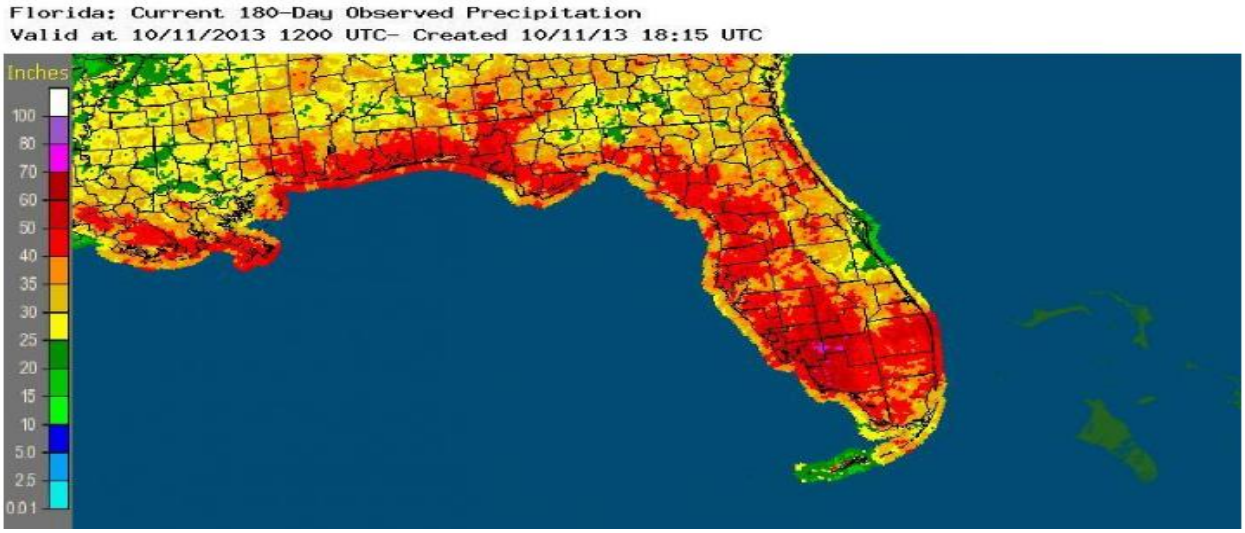


Figure 1: Precipitation in inches from mid-April to mid-October. Most areas received between 35 and 50 inches of rain during this period.

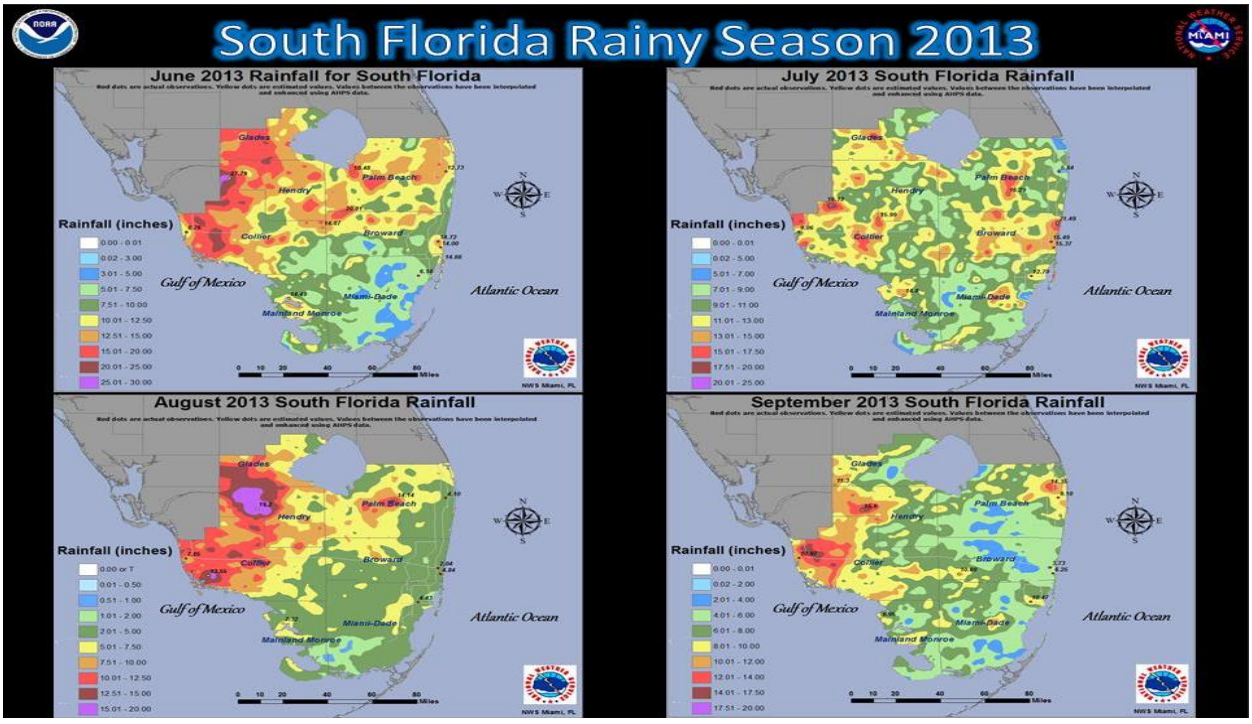


Figure 2: June –September Rainfall by Month

Making the high summer rainfall amounts even more noteworthy is the lack of large-scale tropical systems affecting our area. The only tropical system to affect south Florida's weather this year was an indirect impact from Tropical Storm Andrea in early June. A moisture band extending from Andrea led to torrential downpours and flooding in northeast Miami-Dade and southeast Broward counties, as well as three tornadoes in Palm Beach and Broward counties.

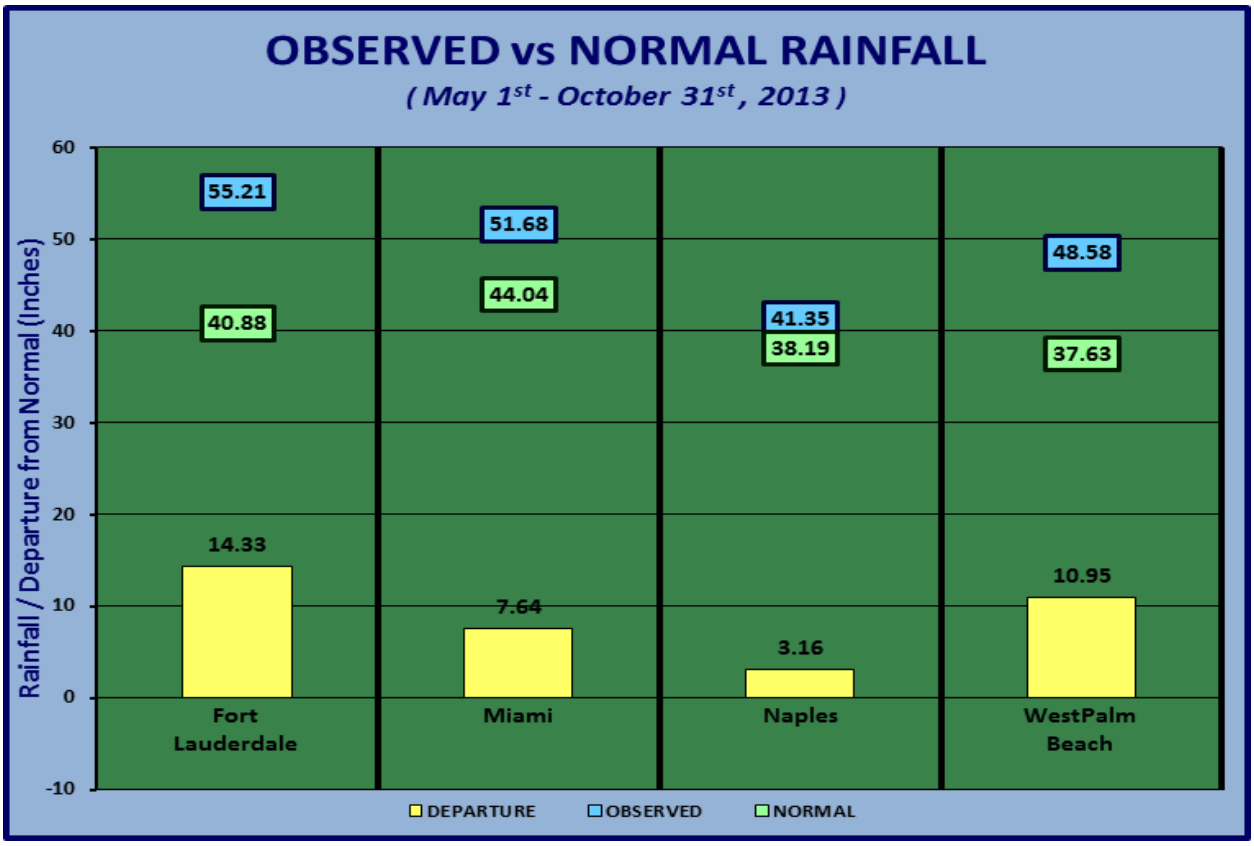
Most of the rainfall this wet season was attributed to the interaction of the typical sea breezes with a predominantly moist and unstable southeast wind flow. This pattern favored the concentration of daily showers and thunderstorms over the interior and western sections of south Florida, with more variable precipitation near the east coast.

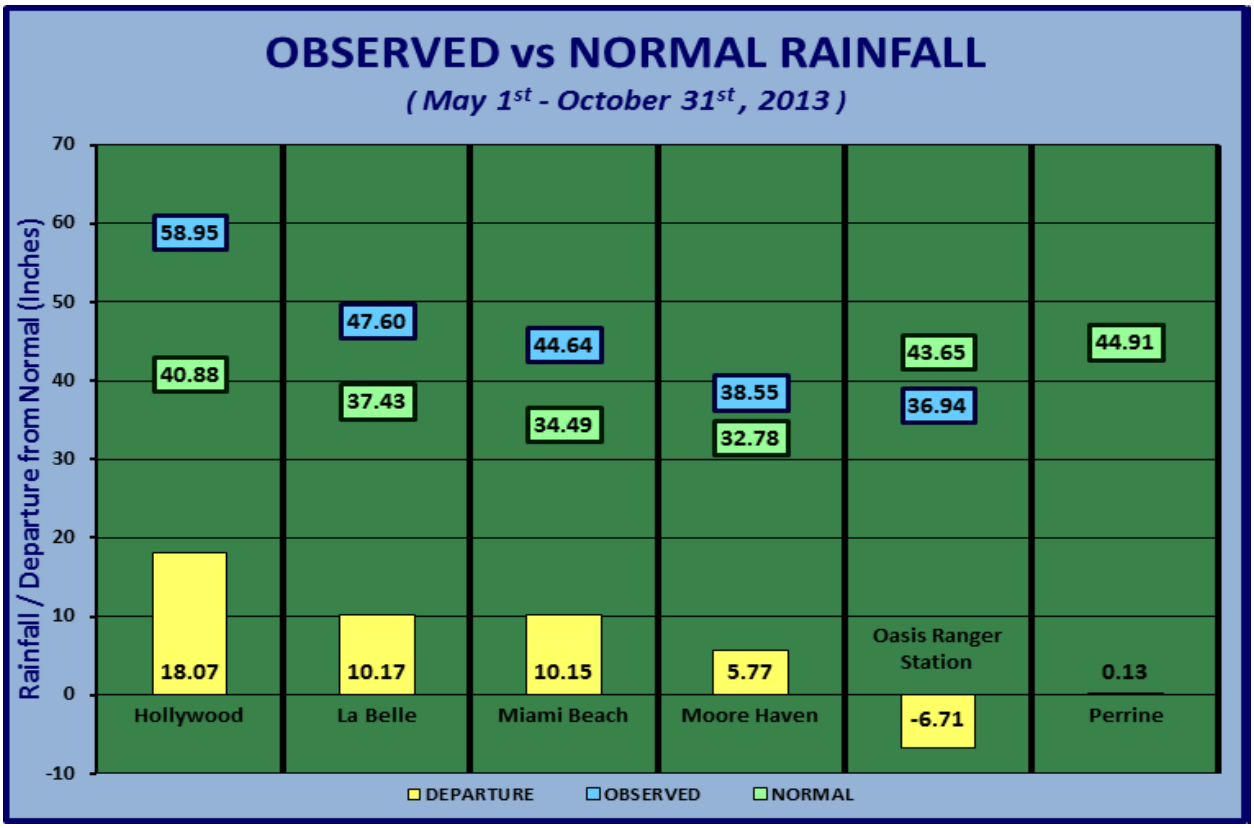
South Florida's Climate/COOP Sites report

All 4 of the main climate sites across South Florida ended the wet season with a surplus, ranging from 3.16 inches at Naples Municipal Airport to 14.33 inches at the Fort Lauderdale-Hollywood International Airport. A key month for Fort Lauderdale reaching this impressive surplus was July, with 15.49 inches of rainfall. This is now the wettest July on record, surpassing 1985 as the previous record-holder with 14.02 inches. July 2013 ended with a surplus of about 9.5 inches at the Fort Lauderdale area observation site.

Most COOP sites also ended this period with a surplus. An exception to this was Oasis Ranger Station with a deficit of 6.71 inches, or roughly 15% below normal. Oasis also claimed the driest month for a COOP site in October, when only 0.21 inches was recorded. On the opposite side of the spectrum, the wettest month for a COOP site was May at Juno Beach, when 22.05 inches of rainfall was recorded.

The following graphics depict the observed and normal 6-month rainfall totals from May through October, in blue and green respectively, and the departure/difference from normal in yellow. The first graphic is for South Florida's airport climate locations, and the second is for select COOP locations across the area.


OBSERVED vs NORMAL RAINFALL
(May 1st - October 31st, 2013)
Rainfall / Departure from Normal (Inches)
60
50
40
30
20
10
0
-10
55.21
40.88
14.33
51.68
44.04
7.64
41.35
38.19
3.16
48.58
37.63
10.95
Fort Lauderdale
Miami
Naples
WestPalm Beach
DEPARTURE
OBSERVED
NORMAL


OBSERVED vs NORMAL RAINFALL
(May 1st - October 31st, 2013)
Rainfall / Departure from Normal (Inches)
70
60
50
40
30
20
10
0
-10
58.95
40.88
18.07
47.60
37.43
10.17
44.64
34.49
10.15
38.55
32.78
5.77
43.65
36.94
-6.71
44.91
0.13
Hollywood
La Belle
Miami Beach
Moore Haven
Oasis Ranger Station
Perrine
DEPARTURE
OBSERVED
NORMAL

Average monthly temperatures, at South Florida's four main climate sites, ranged from 2.6 degrees Fahrenheit below normal (Fort Lauderdale, July) to 1.8 degrees above normal (West Palm Beach, August). West Palm Beach's August was warm enough to rank as the third warmest on record. The warmest August for West Palm Beach is a tie between 2005 and 1987, when the average temperature was 84.9 degrees.

Six-month averages ranged from 1.3 degrees below normal (Fort Lauderdale) to 0.2 degrees above normal (West Palm Beach), not quite warm or cool enough to break into the 'Top 10' for any climate locations.

The table below breaks down the average monthly temperature and departure from normal at the Fort Lauderdale, Miami, Naples, and Palm Beach Airports, as well as the 6-month average monthly temperatures and departures from normal.

Average Monthly Temperature (degrees Fahrenheit) & Departure from Normal *(May 1 – October 31, 2013)*

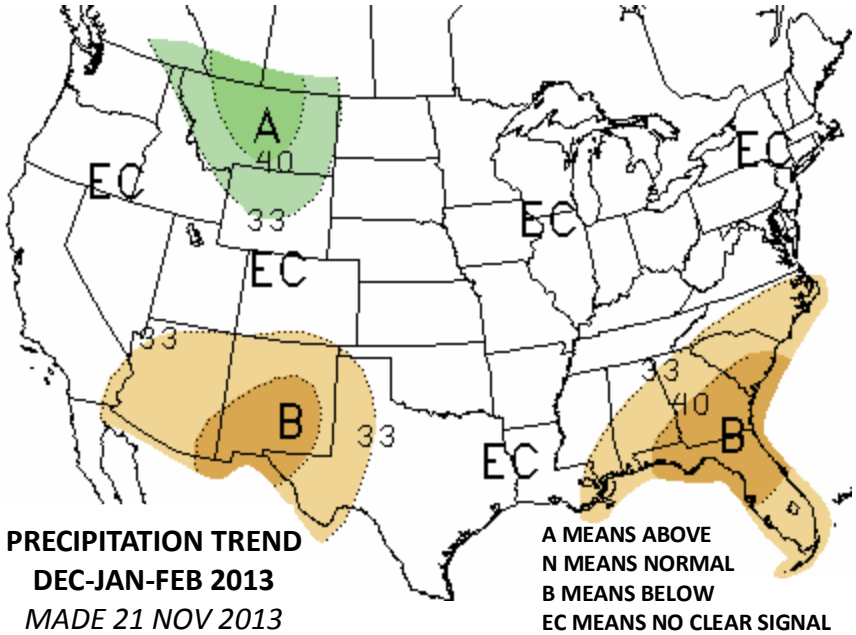
	Fort Lauderdale		Naples		Miami		West Palm Beach	
	Avg.	Dep.	Avg.	Dep.	Avg.	Dep.	Avg.	Dep.
May '13	78.5	-1.7	76.6	-1.6	78.9	-1.0	76.2	-2.2
Jun. '13	82.9	-0.2	81.2	-0.7	83.0	+0.3	81.0	-0.4
Jul. '13	81.7	-2.6	81.9	-1.2	82.4	-1.7	83.3	+0.6
Aug. '13	83.5	-1.1	83.0	-0.2	83.9	-0.3	84.8	+1.8
Sep. '13	81.9	-1.3	81.6	-0.8	82.8	-0.1	81.5	-0.3
Oct. '13	79.8	-0.8	79.0	+0.5	80.6	+0.7	80.0	+1.7
6-Month	**81.4**	**-1.3**	**80.6**	**-0.7**	**81.9**	**-0.4**	**81.1**	**+0.2**

December through February Outlook

A factor which often influences Florida weather in the dry season is the ENSO (El Niño/Southern Oscillation). ENSO is characterized by its warm phase, or El Niño, and its cold phase, or La Niña, with rather well-defined effects on Florida weather during the dry season. However, we are currently in the neutral phase of ENSO. This neutral phase leads to less impact on Florida weather. Instead, dry season weather patterns are largely influenced by other factors, most of which cannot be predicted more than two weeks in advance, such as the North American Oscillation (NAO).

One present factor that may act as an influence is the Pacific Decadal Oscillation (PDO), defined by water temperature trends in the northern Pacific Ocean. The current negative phase of the PDO is often associated with drier-than-normal winter and spring months across south Florida. Nevertheless, the overall confidence in the dry season outlook is rather low based on the absence of key factors such as ENSO.

The Climate Prediction Center's 3-month forecast depicts a trend for below normal rainfall across the southeast United States, but doesn't have a clear indication on the potential temperature trend for South Florida.



Courtesy of the Climate Prediction Center

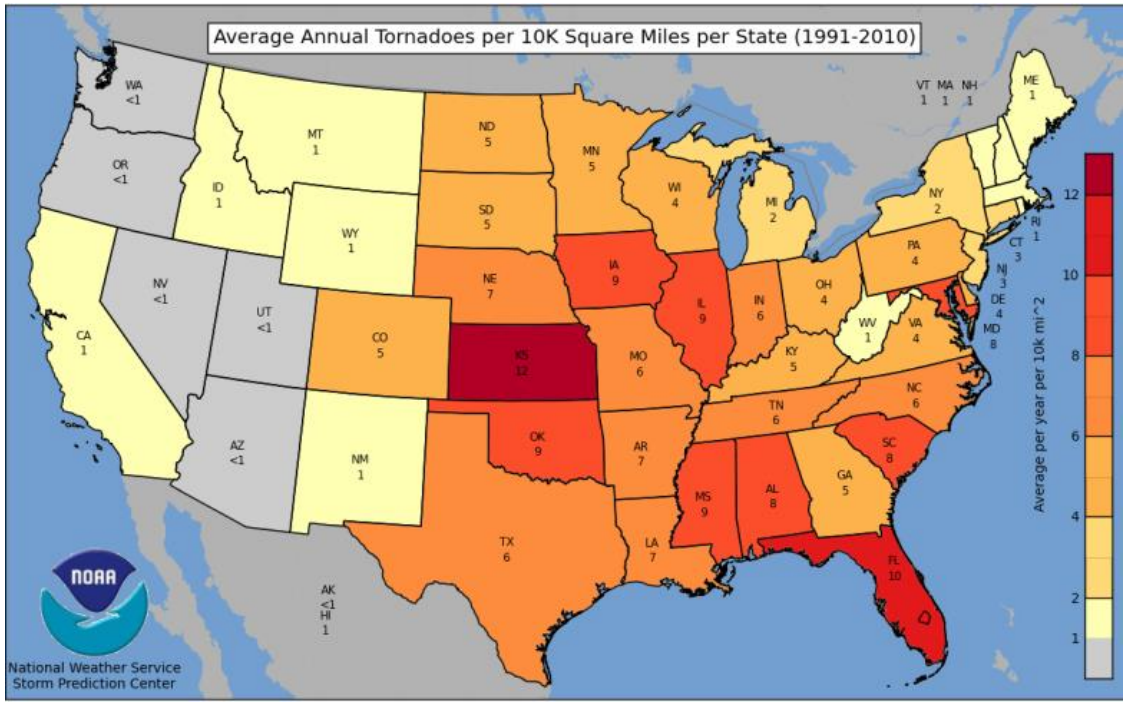
Severe Weather Climatology

http://www.weather.gov/skywarn/

By Dan Gregoria and Evelyn Rivera

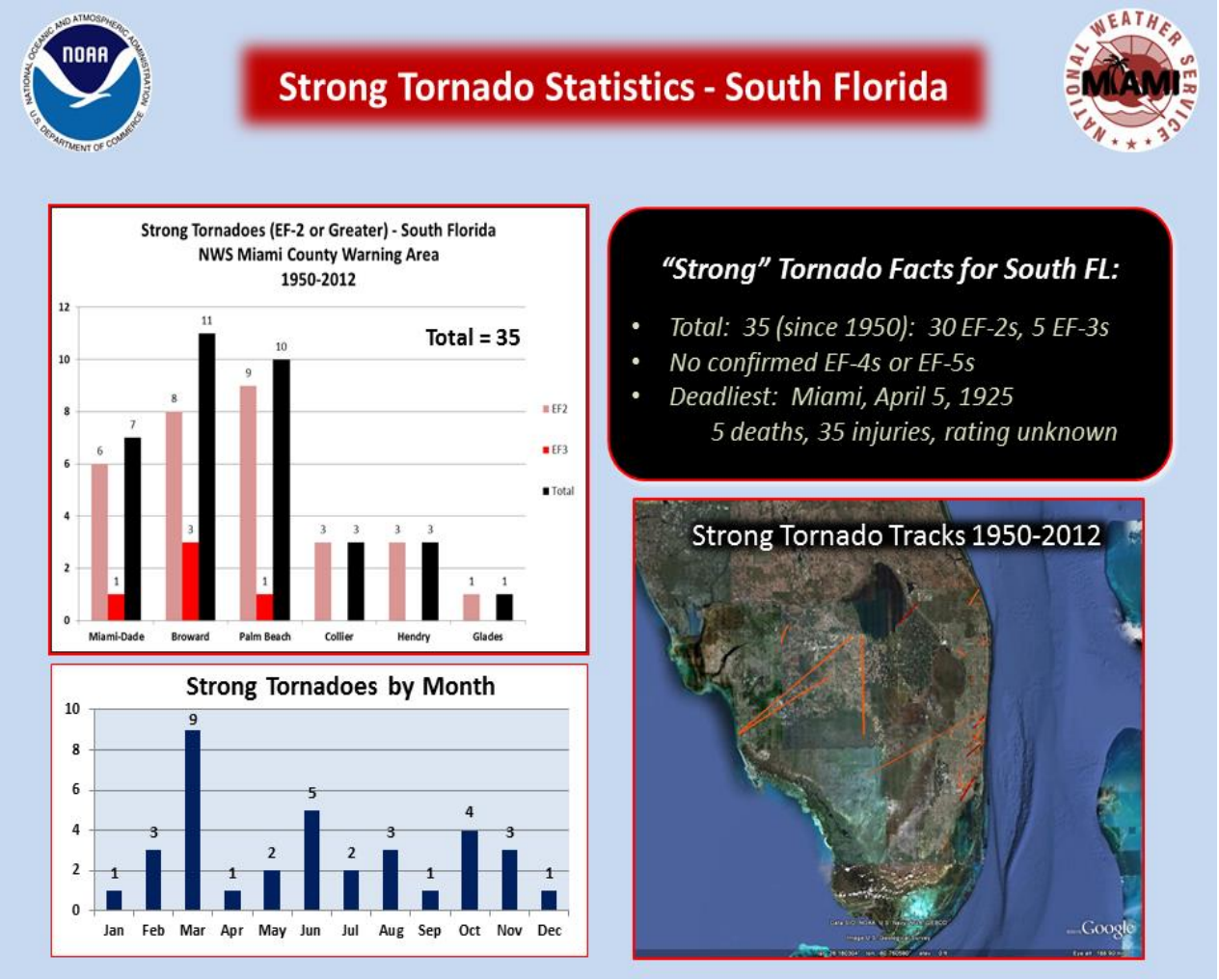
Strong Tornadoes - South Florida

When most people hear the word "tornado" they think of places such as Kansas, Oklahoma or Texas. Not many think of Florida. However, tornadoes are not a rare occurrence in the Florida peninsula. In fact, the map below shows that Florida ranks second in the United States in terms of tornado occurrences per square mile during the period 1991-2010.



Courtesy of NWS's Storm Prediction Center

The most damaging tornadoes (EF-2 or greater on the Enhance Fujita Scale) are common from the plains states and across the Deep South across Mississippi and Alabama. Even so, strong tornadoes have affected South Florida. In fact, a total of 35 strong tornadoes have struck the NWS Miami County Warning Area since 1950. No EF-4 or EF-5 tornadoes have been recorded.

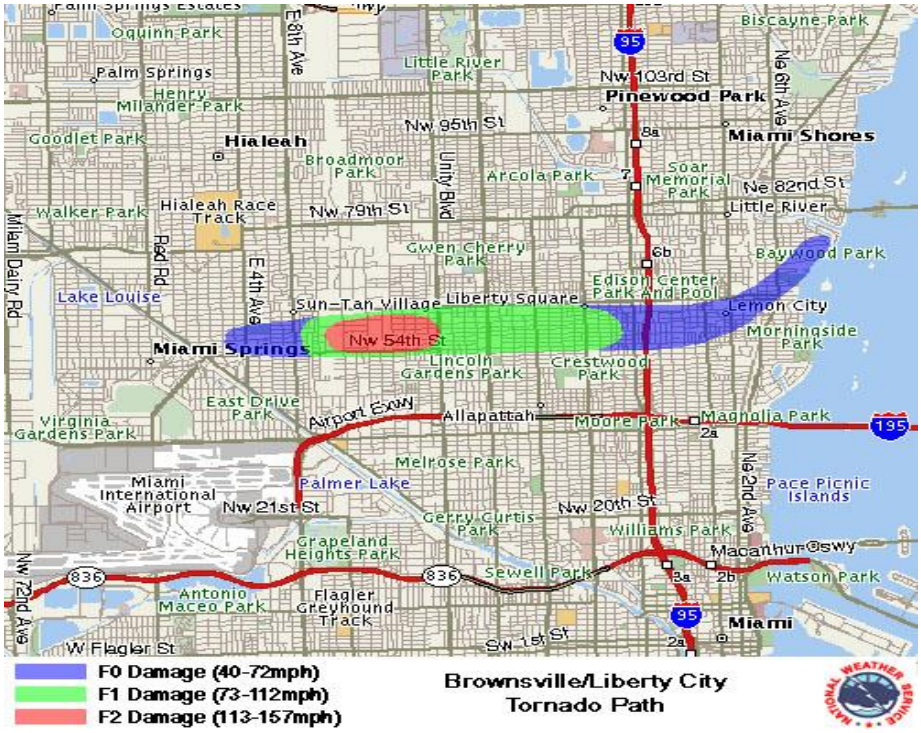


The graph above shows the statistics about the strong tornadoes (EF2 or higher) experienced across South Florida. A total of 35 of these tornadoes have been reported over a period that covers from 1950-2012. The month of highest frequency of strong tornadoes for our area is March. Broward is the county that has seen the strongest tornadoes, followed by Palm Beach, then Miami-Dade. Collier, Hendry and Glades Counties have seen the least.

The last *strong* tornado to strike South Florida was on October 18, 2011 in the Sunrise and Plantation area. The damage was significant, as seen in this photo below.

Picture illustrates the serious damage caused by the 2011 tornado.

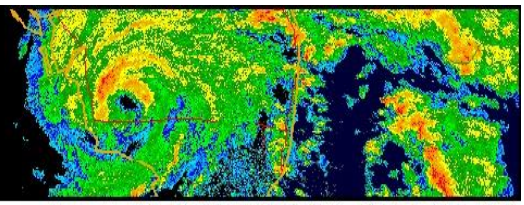
The last *deadly* tornado to strike South Florida occurred on March 27, 2003, when an EF-2 tornado struck the Miami area. One person died and 14 were injured when this strong tornado moved across the Liberty City-Brownsville area.



This image illustrates the path and estimated intensity of the Liberty City/Brownsville tornado.

So, although strong tornadoes are not common here, it is important to realize that they can and do occur. Therefore, when a Tornado Watch is issued, stay weather alert and be ready to act should a Tornado Warning be issued for your area.

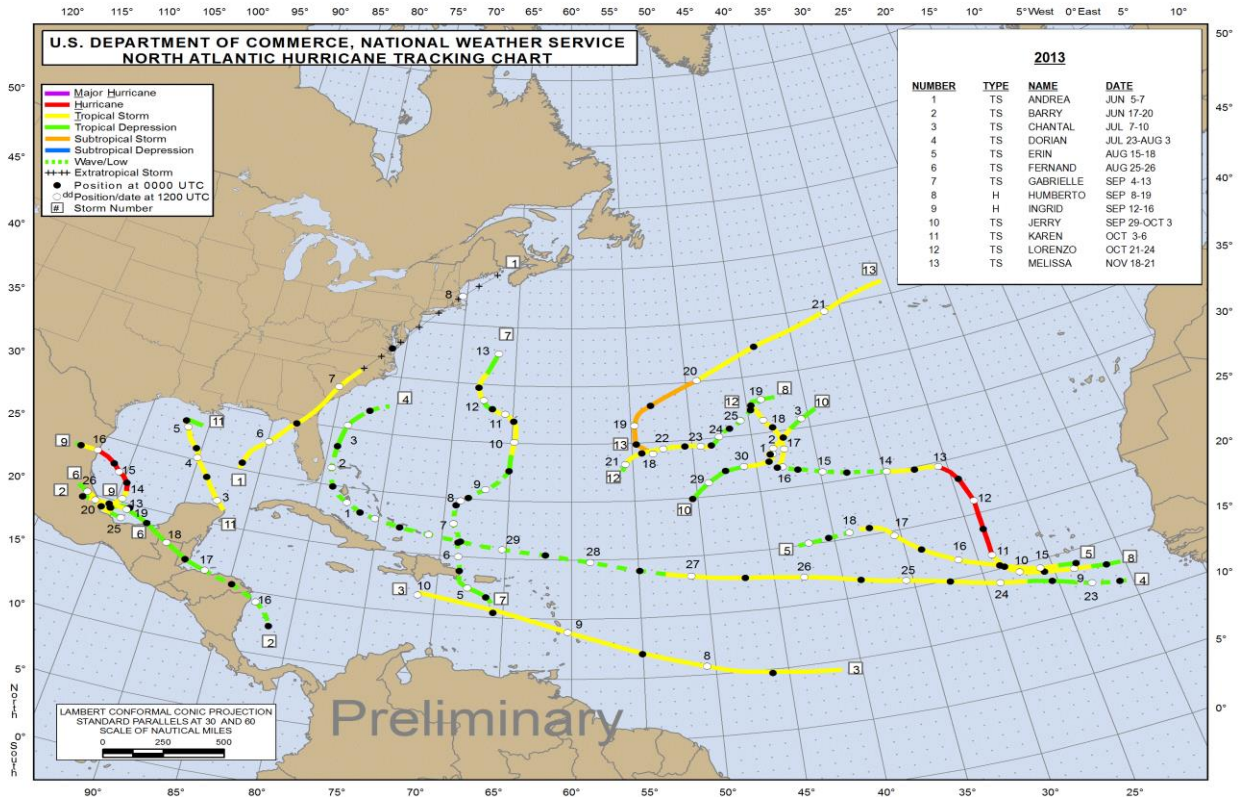
Hurricane Season 2013



Tropical Storm Fay in Collier County - August 2008

By Evelyn A. Rivera-Acevedo

The 2013 Atlantic Hurricane season is definitely one for the records. It had the fewest number of hurricanes since 1982, and it is ranked the sixth-least active Atlantic hurricane season since 1950 in terms of strength and duration of named systems. This season was also considered the third below-normal season in the last 19 years since 1995, when the current high-activity era for Atlantic hurricane began.



Courtesy of National Hurricane Center (NHC)

The following table compares the 2013 hurricane season to the historical average, broken down by storm intensity.

Storm Activity for the Atlantic Basin: 2013 versus Average

Intensity	2013	Average
Total Named Storms (39-73 mph)	13	12
Total Hurricanes (74+ mph)	2	6
Total Major Hurricanes (111+ mph)	0	3

Only tropical storm Andrea made landfall in the United States this year. This system brought tornadoes, heavy rain and minor flooding to portions of Florida, eastern Georgia and eastern South Carolina, causing one fatality.

The official NOAA outlook for the 2014 hurricane season will be released just before the June 1st start date of next year's hurricane season. Names for the 2014 Atlantic Hurricane Season will be: Arthur, Bertha, Cristobal, Dolly, Edouard, Fay, Gonzalo, Hanna, Isaias, Josephine, Kyle, Laura, Marco, Nana, Omar, Paulette, Rene, Sally, Teddy, Vicky and Wilfred.

Employee Spotlight

Dusk- Danny Gregoria

By Chris Duke and Evelyn Rivera

Let's meet one of our journeyman forecasters: Chris Duke…

How did you become interested in weather?

My Grandfather definitely sparked my interest in weather growing up. He was a commercial pilot and after he retired, he would always take the time to show me all of the aspects that went into flying an airplane. Knowing the weather was of course one of the most important things. I began to take an interest in weather and aviation as a result, and it grew into an interest in all physical sciences. However I wasn't sure I wanted to be a meteorologist until much

later…late undergrad/grad school. Going into college, astronomy was my main interest.

Where did you study?

I received a B.A. degree in Geography at the University of Memphis in 2000, then an M.S. degree in Geosciences with an emphasis in Meteorology at Mississippi State University in 2004.

What did you do after graduation?

After I finished my graduate coursework, I spent the next year writing my thesis.

Did you have any other weather related job before joining NWS?

In 2005, I took a forecaster job at a private weather company in Houston, TX but quickly realized it was not where I wanted to be. I moved back to Memphis and became a contract weather observer at the Memphis International Airport. I trained for two weeks taking observations in good weather, and then my first solo day was an afternoon shift with severe thunderstorms! It was a day I will never forget, but over time, it allowed me to learn how to make quick decisions under pressure. During this time, I also volunteered at the Memphis NWS office and in November 2007, I was selected for an intern position.

What are your aspirations today?

Besides being the best father I can be to my daughter, my aspirations, as of right now are to become a lead forecaster.

What's the best/worst part of your job?

The best part of my job without question is being able to get paid for doing something that I love to do. It's also great to work and build relationships with people. The worst part would have to be the shift work aspect.

When you are not working here, what do you like to do?

When I'm not at work, I love spending my free time going to the beach with my wife and 10 month old daughter and playing an occasional round of golf.

Thanks for Reading!!!

Festive lights- David Ross

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